

# NORTHROP GRUMMAN

(by Cheryl Simson & Michael Stock)



The educational component of the *1999 Gledden Tour* began at **Northrop Grumman**, home of the F/A18E/F Super Hornet strike fighter. The visit was definitely one of the tour's highlights, thanks to the efforts of Dennis and Eddie who not only spoiled us with badges, food and drinks, but were more than willing to answer our endless questions.

Dennis Duffy is a former Navy fighter pilot, who has been working at Northrop Grumman for 16 years. He has spent the last 5 years in his current job at the Company's LA headquarters. Eddie has been with the Company from Day One; and has been involved in the production of all aircraft. If you have any questions, Eddie is the one to ask.

The visit started with an introductory video, providing the Gledden group with some background into Northrop's operations and products and, for the Commerce-Engineers amongst us, a look at the Company's organizational structure – both before and after recent re-engineering efforts.



After the requisite tour group photo, we moved out towards the F18E/F production line. Dennis and Eddie escorted us the entire length of the line, explaining the major processes involved at all stages. The line itself is contained in the world's largest wooden structure; its wooden construction due to the shortage of steel in America during World War II. Safety and quality were obviously

important to the Northrop staff, with many of the Management students noticing the banners promoting a safe workplace and high quality hung throughout the building.

Northrop are responsible for the 40% of the new F18E/F Super Hornets – including the center and aft fuselage, vertical tails and associated subsystems - with the remaining production work completed by the Boeing Corporation. We were fortunate enough to be able to view up-close (beyond the traditional visitor lines!) an F18 ready for shipment to Boeing.



For more detailed information about Northrop Grumman, visit the Company's Web Site <http://www.northgrum.com>



## Northrop Grumman's Operations

Northrop Grumman is a leading designer, systems integrator and manufacturer of military surveillance and combat aircraft; defense electronics and systems; commercial and military aerostructures; precision weapons and marine and space systems. Headquartered in Los Angeles; the Company maintains a presence throughout the United States, also in the United Kingdom, Australia, Belgium, Canada, China, Egypt, France, Japan, Korea, Saudi Arabia, Singapore, Taiwan and Thailand.

Northrop Aircraft Company was incorporated in 1939, but has since grown into a \$10 billion company, partially through the acquisitions of Grumman Aircraft Engineering Corporation, Lewis and Vought Corporation, Westinghouse Radio Division and Logicon Incorporated.

The Company's business has evolved from primarily airplane manufacturing to high technology defense electronics, systems integration and information technology. It is anticipated that 54% of the Company's operations will be dedicated to electronics in 2003, with only 26% of resources involved in aircraft (17% military).

Following a recent restructuring effort, Northrop Grumman is now divided into three business sectors :

- Integrated Systems & Aerostructures (based in Baltimore)
- Electronic Sensors & Systems (Dallas)
- Logicon (Herndon, Virginia)

## Integrated Systems and Aerostructures Sector

ISA is the prime contractor for the US Air Force's B2 Spirit Stealth Bomber (pictured) and the world's most advanced airborne targeting and battle management system "Joint Surveillance Target Attack Radar System (Joint STARS)". The sector also has a principal role in the development of the Navy's **F/A18 Hornet strike fighter** (the focus of the Gladden Tour visit).



Other major product areas include the EA6B Prowler electronic countermeasures aircraft, the E-2C Hawkeye early warning aircraft upgrade and commercial aerostructures. Northrop Grumman is the world's largest independent supplier of commercial aerostructures; areas of expertise include fuselage and tail sections, doors, control surfaces, nacelles and thrust reversers.

For further information, visit the Integrated Systems & Aerostructures Sector Web Page at [http://www.northgrum.com/isa\\_www/](http://www.northgrum.com/isa_www/)

## Electronic Sensors & Systems

This sector makes a wide variety of defense electronics and systems, airspace management systems, precision weapons, marine systems, space systems, and automation and information systems.

For further information, visit the Electronic Sensors & Systems Web Page at [http://www.northgrum.com/es3\\_www/](http://www.northgrum.com/es3_www/)

Logicon Inc.

Logicon is a wholly owned subsidiary of Northrop Grumman, with expertise in command, control, communications, computers, intelligence, surveillance and reconnaissance. The sector has strong links with the US Government, Navy, Air force and NASA's Kennedy Space Center.

For further information, visit the Logicon Inc. Web Page at [http://www.northgrum.com/log\\_www/](http://www.northgrum.com/log_www/)

## F/A18 Hornet Strike Fighter

More than 1300 F/A18 Hornets have entered the skies since the F/A18 A/B first debuted in 1978. Some 21 years later in 1999, the evolutionary F/A18 E/F Super Hornets are entering production; destined to become the backbone of naval aviation strike warfare well into the next century.



### Timeline

- |      |                        |
|------|------------------------|
| 1980 | F/A 8 A/B              |
| •    | F/A18 C/D              |
| •    | F/A18 C/D Night Strike |
| 1999 | F/A18 E/F Super Hornet |



### F/A18 C/D Hornet

A multi-role, affordable, twin-engine fighter, the Hornet set new standards for reliability, maintainability, survivability and low operating and support costs. It is the international strike fighter of choice for eight Air Forces, including Australia.

## F/A18 E/F Super Hornet



The Super Hornet offers a variety of advantages over its predecessor, the F/A18 C/D Hornet, including :

- Greater range and endurance
- Ability to carry heavier payload
- Increased bring-back capability
- Enhanced survivability
- Built-in potential to incorporate future systems and technologies
- Enhanced combat capability

Typical Super Hornet missions may include :

- Air superiority
- Day/night strike with precision guided weapons
- Fighter escort
- Close air support
- Suppression of enemy air defenses
- Reconnaissance
- Forward air control and air refueling

The first F/A18 E/F Super Hornets was delivered to the US Navy in December, 1998.

## Interesting Questions/Answers

*How long does it take to develop a new aircraft?*

10 – 13 years.

*What kind of restrictions does the Government place on Northrop, with regards to selling F18s to foreign countries?*

Government approval must be granted before Northrop are able to sell F18s to foreign countries. In crisis situations, trade may often be forbidden with enemy countries – this extends not only to new aircraft sales but re-fits and other services.

*Are foreign sales exclusively to governments, or to commercial organizations as well?*

Northrop has many types of alliances, both commercial and with foreign governments (FMS – Foreign Military Sale).

*When is Australia likely to get the new F18E/F Super Hornet?*

Probably around 2008, at a cost of approximately \$50 million each.

*What were some of the reasons behind the design and production of a brand new aircraft (the F18E/F)?*

The older version – the F18C/D – was running out of volume, electricity and cooling capacity. There was also the issue of “bring-back load”; the jets were having to dump unused weaponry to enable a safe landing. The new E/F model has a reduced landing speed due to the greater wingspan, which enables a significant increase in the “bring-back” load – a great saving to the military, who no longer need to throw away millions of dollars of weaponry.

*How long does it take, from the time the order is placed until delivery?*

30 months in total; of which 8 months is taken up by assembly, and 6 months at Boeing “gluing it together”.

*How up-to-date is the technology and information at Northrop Grumman?*

We only work on stuff that is dated “today”.

